

1 The invention claimed is:

1 1. A method of compacting an endoprosthesis comprising
2 providing a self-expanding endoprosthesis comprising a stent-element;
3 providing at least one tapered die proportioned to compact the
4 endoprosthesis;
5 passing the endoprosthesis through the at least one tapered die to reduce
6 dimensions of the endoprosthesis; and
7 passing the endoprosthesis through the at least one tapered die at least one
8 additional time.

1 2. The method of claim 1 that further comprises
2 providing flutes and grooves on the at least one tapered die; and
3 passing the endoprosthesis through the tapered die with with flutes and
4 grooves in order to establish pleated folds in the endoprosthesis when compacted.

1 3. The method of claim 1 that further comprises
2 providing the stent-element with forward facing apices and rearward facing
3 apices;
4 providing a tether line attached to or aligned with one or more of the apices;
5 pulling the endoprosthesis through the at least one tapered die using the
6 tether line.

1 4. The method of claim 3 that further comprises
2 providing an actuation mechanism;
3 attaching the tether line to the actuation mechanism to pull the
4 endoprosthesis through the at least one tapered die.

1 5. The method of claim 3 that further comprises
2 providing multiple flutes and grooves within the at least one tapered die;
3 providing multiple tether lines;
4 aligning the tether lines with only forward facing apices so that when the
5 tether lines are pulled through the grooves only the forward facing apices are visible on the
6 outside of the compressed endoprosthesis.

1 6. The method of claim 2 that further comprises
2 positioning the flutes evenly around the tapered die so as to produce uniform
3 spacing of pleats around the compressed endoprosthesis.

1 7. The method of claim 6 that further comprises
2 providing a uniform spacing of grooves within the at least one tapered die;
3 providing a tether line to correspond with each groove; and
4 passing the endoprosthesis through the tapered die using the tether lines.

- 1 8. The method of claim 1 that further comprises
2 including a cover attached to the stent-element.
- 1 9. The method of claim 1 that further comprises cooling the endoprosthesis prior
2 to passing through the tapered die.
- 1 10. The method of claim 1 that further comprises allowing the endoprosthesis to
2 expand before passing it through the at least one tapered die at least one additional time.
- 1 11. A method of compacting an endoprosthesis into a compacted dimension
2 comprising
3 providing a self-expanding endoprosthesis comprising a stent-element;
4 providing at least one tapered die proportioned to compact the
5 endoprosthesis, the tapered die including multiple flutes and grooves therein;
6 passing the endoprosthesis through the tapered die to reduce its dimensions,
7 the flutes and grooves causing the endoprosthesis to fold into pleats in its compacted
8 dimension.
- 1 12. The method of claim 11 that further comprises
2 passing the endoprosthesis through the tapered die at least one additional
3 time.
- 1 13. The method of claim 11 that further comprises
2 subsequently passing the endoprosthesis through a second taper die having
3 a smaller diameter.
- 1 14. The method of claim 11 that further comprises passing the endoprosthesis
2 through a tapered die having a larger diameter prior to compacting in the at least one
3 tapered die.
- 1 15. The method of claim 11 that further comprises
2 providing the stent-element with forward facing apices and rearward facing
3 apices;
4 providing a tether line attached to or aligned with one or more of the apices;
5 pulling the endoprosthesis through the at least one tapered die using the
6 tether line.
- 1 16. The method of claim 15 that further comprises
2 providing an actuation mechanism;
3 attaching the tether line to the actuation mechanism to pull the
4 endoprosthesis through the at least one tapered die.
- 1 17. The method of claim 15 that further comprises
2 providing multiple tether lines;

aligning the tether lines with only forward facing apices so that when the tether lines are pulled through the grooves only the forward facing apices are visible on the outside of the compressed endoprosthesis.

18. The method of claim 11 that further comprises positioning the flutes evenly around the tapered die so as to produce a uniform spacing of pleats around the compressed endoprosthesis.

19. The method of claim 18 that further comprises providing a uniform spacing of grooves within the at least one endoprosthesis;

providing a tether line to correspond with each groove; and
passing the endoprosthesis through the tapered die using the tether lines.

20. The method of claim 11 that further comprises cooling the endoprosthesis prior to passing through the tapered die.

21. The method of claim 12 that further comprises allowing the endoprosthesis to expand before passing it through the at least one tapered die at least one additional time.

22. A method of compacting an endoprosthesis comprising
providing an endoprosthesis;
providing a first tapered die proportioned to compact the endoprosthesis;
providing a second tapered die;
passing the endoprosthesis through the first tapered die;
subsequently passing the endoprosthesis through the second tapered die.

23. The method of claim 22 that further comprises providing a second die that is approximately the same sized diameter as the diameter of the first die.

24. The method of claim 22 that further comprises providing a second die that is a smaller diameter than the diameter of the first die.

25. The method of claim 22 that further comprises providing flutes and grooves on at least one of the tapered dies.

26. The method of claim 22 that further comprises
providing as part of the endoprosthesis a stent element with forward facing apices and rearward facing apices;

providing a tether line attached to or aligned with one or more of the apices;
pulling the endoprosthesis through the dies using the tether line.

27. The method of claim 26 that further comprises
providing an actuation mechanism;
attaching the tether line to the actuation mechanism to pull the endoprosthesis through the tapered die.

1 28. The method of claim 25 that further comprises
2 providing multiple flutes and grooves within the at least one tapered die;
3 providing multiple tether lines;
4 aligning the tether lines with only forward facing apices so that when the
5 tether lines are pulled through the grooves only the forward facing apices are visible on the
6 outside of the compressed endoprosthesis.

1 29. The method of claim 25 that further comprises
2 positioning the flutes evenly around the tapered die so as to produce uniform
3 spacing of pleats around the compressed endoprosthesis.

1 30. The method of claim 29 that further comprises
2 providing a uniform spacing of grooves within the at least one tapered die;
3 providing a tether line to correspond with each groove; and
4 passing the endoprosthesis through the tapered die using the tether lines.

1 31. The method of claim 22 that further comprises
2 providing an endoprosthesis that includes a stent-element and a cover.

1 32. The method of claim 22 that further comprises
2 providing as the endoprosthesis a stent.

1 33. The method of claim 32 that further comprises
2 providing a stent that is self-expanding.

1 34. The method of claim 33 that further comprises
2 providing a graft element attached to the stent.

1 35. The method of claim 22 that further comprises cooling the endoprosthesis
2 prior to passing through the first tapered die.

1 36. The method of claim 22 that further comprises allowing the endoprosthesis to
2 expand before passing it through the second tapered die.

1 37. A method of compacting an endoprosthesis comprising
2 providing a self-expanding endoprosthesis having a first diameter;
3 compacting the endoprosthesis to a second diameter smaller than the first
4 diameter;
5 allowing the endoprosthesis to expand to a diameter larger than the second
6 diameter;
7 subsequently compacting the endoprosthesis to a third diameter smaller than
8 the second diameter.

1 38. The method of claim 37 that further comprises
2 providing at least one tapered die proportioned to compact the
3 endoprosthesis;
4 passing the endoprosthesis through the at least one tapered die to reduce
5 dimensions of the endoprosthesis.

1 39. The method of claim 38 that further comprises
2 providing flutes and grooves on the at least one tapered die; and
3 passing the endoprosthesis through the tapered die with with flutes and
4 grooves in order to establish pleated folds in the endoprosthesis when compacted.

1 40. The method of claim 38 that further comprises pulling the endoprosthesis
2 through the at least one tapered die using at least one tether line.

1 41. The method of claim 40 that further comprises
2 providing an actuation mechanism;
3 attaching the tether line to the actuation mechanism to pull the
4 endoprosthesis through the at least one tapered die.

1 42. The method of claim 39 that further comprises
2 positioning the flutes evenly around the tapered die so as to produce uniform
3 spacing of pleats around the compressed endoprosthesis.

1 43. The method of claim 42 that further comprises
2 providing a uniform spacing of grooves within the at least one tapered die;
3 providing a tether line to correspond with each groove; and
4 passing the endoprosthesis through the tapered die using the tether lines.

1 44. The method of claim 37 that further comprises
2 providing an endoprosthesis that comprises a stent-element and an attached
3 cover.

1 45. The method of claim 37 that further comprises cooling the endoprosthesis
2 prior to compacting it.